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BOOK OF ABSTRACTS

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Biochemical characterization of the genetic resources of wild coffee trees collection in Réunion using near infrared spectroscopy

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RATIONALE

Near infrared spectroscopy (NIRS) has been widely used for green coffees characterization and especially for the quantification of the main chemical constituents. The CIRAD database contains more than 2210 spectra and efficient calibrations for major constituents. However, this database is mostly constituted of *Coffea arabica* and *C. canephora*, which limits its representativeness. In order to enhance the database robustness, the analysis of wild coffee species has been undertaken.

METHODS

Over 4 years, 462 seed samples, from 32 species, were collected on individual trees from the *Coffea* Biological Resources Centre in Réunion. Ground dried samples were analyzed for their absorbance spectrum using a FOSS 6500 monochromator (FOSS, Hillerod, Denmark). A selection, based on spectra, of the 90 most representatives samples was done using PCA and Mahalanobis neighborhood distances. The selected samples were analyzed for their caffeine, trigonelline, fat and chlorogenic acids (CGA) contents using standard analytical chemistry protocols.

RESULTS

The distance threshold corresponding to the neighborhood was 0.55. The 90 samples came from 22 different coffee species. The caffeine content ranged from 0 to 3.3%, trigonelline from 0.25 to 1.52%, CGA from 0,22% to 10,53% and fat from 7.12% to 34,45% (dmb). The enhanced predicted models using this new data set present standard errors of 0.08%, 0.07%, 0.58% and 0.48% for respectively caffeine, trigonelline, CGA and fat. These performances are close to original models ones, with an increase of the content ranges, especially for fat.

CONCLUSIONS & PERSPECTIVES

This study demonstrated the efficiency of the use of genetic diversity to enhance the robustness of the database. This approach lead to a real increase of the range for caffeine and fat contents. Thus, the resulting calibrations cover a larger range of values without significant losses of accuracy. The use of Mahalanobis distances permitted an efficient improvement of the calibrations representativeness with a limited number of samples. The new calibrations will be applied to the whole database in order to describe biochemical diversity in wild coffee species. The study will also be pushed forward to other chemicals such as fatty acid composition and diterpenes profiles.